

Course Content, Methods, and Headaches in Teaching Health to College Students

STEWART C. THOMSON, M.D., M.P.H.

Nearly 37,000 students at the University of Minnesota have taken the basic courses in personal and community health taught by Dr. Thomson during the last 15 years. Successful completion of a stiff health course is a requirement for the bachelor's degree awarded by several colleges of the university, but the size of his classes, from 300 to more than 600 students, is also an indication of the popularity of these courses as electives. Dr. Thomson described his experiences in teaching these courses at the 34th annual meeting of the American College Health Association held in Minneapolis in 1956. This paper is based on his speech.

TEACHING health courses at the University of Minnesota is one of the functions and responsibilities of the School of Public Health, which is in the College of Medical Sciences. Basic instruction is provided in introductory courses in personal and community health. These are prerequisite to advanced courses which deal with particular interests such as environmental sanitation, nutrition, and school health problems. Several colleges of the university include a basic course in personal health among the requirements for graduation with a bachelor's degree. Some colleges require further courses. The College of Education and the College of Pharmacy are in this group. A great number of students each year make inquiries concerning health courses as electives after the completion of the required course, or courses.

That there is a steadily growing interest of the public in health information is a generally

Dr. Thomson is a professor and associate director of the School of Public Health, University of Minnesota, Minneapolis.

accepted fact. Popular magazines, newspapers, radio and television programs, and numerous advertisements on billboards refer to health problems. Health matters come up in general conversation. Surely, as part of a liberal education in this day and age, a college student needs accurate and adequate information about health matters. Sound, scientific facts are essential for an understanding of health problems. They are the best armamentaria to combat superstitions, ignorance, and prejudice. They are the most effective remedies to overcome worries about health. It has been said that "we rarely worry about the things we understand. It is the unknown that fills us with apprehension" (1). Scientific facts that are understood and found to be meaningful can frequently overcome ungrounded fears. But health courses should not only be concerned with personal health. Today, more than ever before, "none of us liveth to himself." As citizens who are to be leaders in their communities, college students should have knowledge of the broader health problems of this day. They should have the opportunity to acquaint themselves with local, State, national, and international health problems, and the resources which are available for improving health.

Objectives and Course Content

Following are the objectives of the general courses in personal health.

1. To help the student understand himself as a living organism.
2. To help the student become familiar with the various influences that have an effect on health.
3. To provide the student with sound, scientific

tific facts that will aid him in developing an adequate understanding of personal hygiene and the reasons behind proper health practices.

4. To help the student strive toward the fuller development of proper health attitudes and practices not only because of his own health, but also because as a parent he will greatly influence the health of his children.

5. To help the student become a better citizen of his community. Only as he understands his own health problems can he participate fully and understandingly in the many community problems which are of concern to healthful living.

The basic courses in personal and community health are designed to meet the needs and interests of college students. They are not a review of health courses taken by students in elementary and secondary schools no more than are the college courses in English composition. Many times a review of fundamental material is needed in health courses, just as in other college courses. Not all students have had the same degree of adequate preparation in certain areas of the subject.

There are two basic courses in personal health offered during each of the three quarters of the academic year. Both carry two credits. There are no prerequisites. The longer established of the two is Public Health 3, a general course in personal health. It is not planned for the specific interests of any particular group. The enrollment in a recent quarter, for example, included students in liberal arts, education, agriculture, home economics, business administration, forestry, pharmacy, mortuary science, and several branches of engineering. The students in liberal arts include those in certain curricula such as prelaw, pretheology, and pre dentistry as well as students who plan to major in a wide variety of fields such as history, sociology, botany, and mathematics.

Several years ago another basic course in personal health, Public Health 2, was added to the courses already offered. This course, which is taken principally by students in liberal arts, places more emphasis on fundamental anatomy and physiology.

As an example of the subjects included in one of the courses in personal health, the Public Health 3 course in a recent quarter included the

following subjects: (*a*) understanding ourselves as living organisms; (*b*) certain essentials for health; (*c*) nutritional needs; (*d*) safe milk, water, and food; (*e*) digestive disturbances; (*f*) prevention and care of respiratory disorders; (*g*) auditory and visual problems; (*h*) dental health; (*i*) common skin diseases; (*j*) protection against communicable diseases; (*k*) certain important health problems of the present day including diseases of the heart and blood vessels, cancer, mental health, and accidents; (*l*) rehabilitation of the handicapped; (*m*) geriatrics; (*n*) alcoholism and narcotic addiction; (*o*) personal and public health aspects of animal-borne diseases; (*p*) health problems of the traveler; (*q*) parenthood; and (*r*) official and voluntary health agencies. Some topics, of course, form the subject of more than one lecture.

There are two courses in community aspects of health, Public Health 4 (Health Problems of the Community), which carries two credits, and Public Health 51 (Community Hygiene), which carries three credits. Each is offered once a year. Registrants in these courses must have completed satisfactorily a course in personal health. As an example of subjects covered, in a recent quarter the Public Health 4 course included lectures and discussions on these topics: (*a*) origins of community health; (*b*) Federal agencies concerned with health; (*c*) State health departments; (*d*) local health agencies; (*e*) health facilities in a community; (*f*) voluntary health agencies; (*g*) programs in health care; (*h*) vital statistics; (*i*) combating diseases spread from person to person; (*j*) controlling sources of infection in animals; (*k*) significance of arthropod-borne diseases to the community; (*l*) international health problems of special interest; (*m*) food sanitation problems of the community; (*n*) the water supply of a community; (*o*) disposal of a community's waste materials; (*p*) the community's attack on accidents; (*q*) rural health and safety; (*r*) community interest in mental health; (*s*) occupational health; (*t*) maternal and child health problems; (*u*) health in the community's schools; (*v*) community interest in chronic diseases; (*w*) air pollution; and (*x*) civil defense.

There is also a course in health for students who have not taken Public Health 2 or 3 during

their first 2 years of college. It includes material on both personal and community health. This course, known as Public Health 50, meets three times each week; it has no prerequisites; it is offered twice during the academic year, once in summer session and once a year in the extension division's night classes. A large number of students choose to enroll in Public Health 50 which gives three credits on its successful completion. This is especially true of students in the College of Education and the College of Pharmacy because the requirement of these colleges for instruction in both personal and community health problems can be met in one course.

All the health classes are large. One quarter there were 753 students in Public Health 3. Every seat in the largest classroom on campus was occupied. In the fall quarter of 1961 there were 492 in Public Health 3 and 252 in Public Health 2. The combined course, Public Health 50, has around 500 students each quarter. Necessarily the classes are lecture courses.

Students in all health courses are assigned readings in a textbook. Lists of references and reading suggestions are also provided. Sometimes mimeographed pages of questions based on lectures and readings over a particular portion of the work are made available. Films are sometimes shown in connection with certain lectures and, in addition, may be used for review at the end of the quarter. Occasionally written exercises are required. Several times the members of the basic courses have kept records of their meals for a week and then have calculated caloric values. Now and then the assignment has been to prepare an annotated bibliography on a health topic of particular interest and of the class member's own choice.

Each student in the Public Health 50 course selects and reads a book in the field of the history of health or a book which is a popular but scientifically accurate discussion of some health subject. Lists of around 150 books from which the selection is to be made are distributed in class. The form of the required written report varies each quarter and thus the danger of book reports being passed from one quarter to another is obviated. The final examination always includes an essay question of a very general nature about the book which has been read

Examples of books students often select are "Disease and Destiny" by Ralph H. Major, "Exploring the Dangerous Trades" by Alice Hamilton, "Doctors on Horseback" by James T. Flexner, "James Lind" by Louis H. Roddis, "The Great Doctors" by Henry E. Sigerist, "Rats, Lice and History" and "As I Remember Him" by Hans Zinsser, and "Louis Pasteur, Free Lance of Science" by René Dubos. Since some books on the list are now published in paperbacks (2, 3), a large number of students purchase one or more books on the list for their own libraries instead of selecting a book on the shelves of the university library or other libraries in the vicinity. It is not uncommon for a student to read several books instead of the required one.

Sometimes the members of the class have been required to keep a notebook of current articles on health topics from newspapers and magazines published during the quarter. As a part of the assignment, they include in their notebooks a glossary of the scientific terms new to them. Students are encouraged to write comments concerning the articles. Last fall one of the men in the class included a large number of advertisements related to health subjects. His comments were principally on some of the erroneous ideas which he had noticed. He especially mentioned the exaggerated claims made in several of the advertisements. One student criticized the misuse of the word "serum" in a newspaper article concerning Salk vaccine. Another called attention to an article which gave an inaccurate explanation of the significance of the Mantoux test. This was published during a tuberculin testing program in the schools of the community. His comment was, "I think the writer of that article should make a correction because many parents will become unnecessarily alarmed." These examples serve to illustrate the point that the keeping of a notebook of this kind tends to make the student read the many articles related to health with greater discernment. He will be reading newspapers and magazines all his life, and this assignment should give him some experience in reading with more acumen.

Students, regardless of their major field of study, appear to have a real interest in the history of health. Frequently the lectures con-

tain references to historical incidents. Mimeographed copies of short biographies of outstanding contributors to the advancement of the knowledge of health are given to the class at the opening of the quarter. Often a student will stop at the close of a lecture and tell of some motion picture, television play, book, or magazine article in which there was reference to some incident from medical history. More than one student has found it of particular interest that some person on "the history of health list" was mentioned in another course (Oliver Wendell Holmes and Benjamin Franklin, for example.).

Each student is assigned a seat in the lecture hall. One of the secretaries each day checks the vacant seats on a mimeographed chart of the room. Occasionally students are given attendance cards to sign. There are several reasons why it has proved desirable to keep a record of attendance in these very large classes. Often an inquiry comes from the admissions office as to the last date of a student's attendance. One of the several college offices may call to see if a student is attending class. Without an attendance roll it would be impossible to provide this information. Sometimes from the roll book it is observed that a student has been absent frequently. In such instances he is written a note or called to the office in an attempt to ascertain the reason.

Examinations and Grades

Written examinations are given during the course. The usual procedure is to have a mid-quarter examination which lasts 1 class hour and a final examination which occupies 2 hours.

Some years there have been several short quizzes during the quarter in place of a longer examination at midquarter. This is the better plan, but experience has shown that to conduct an examination properly for such a large group requires borrowing more staff members to serve as proctors than can often be spared from their regular duties. The students are separated into sections according to the alphabet. On examination days they report to assigned rooms where alternate seating is possible. The members of the staff of the School of Public Health, from the director to the newest graduate as-

sistant, have given yeoman service at examination time. If an examination is to be an important part of a teaching program, it is necessary that it not be conducted carelessly.

Each student signs a record book as he hands his completed examination paper to one of the staff. It would be easy to misplace a paper while grading such a large number of examinations. The student's signature in the book is his receipt that he has submitted his paper. The instructor, in turn, has a list of those whose papers were handed to the proctors. On several occasions it has proved of great value to have a record of this kind.

Inquiries are often made as to the type of examinations. The examinations in these courses have been called "cafeteria type" by some students because of the many kinds of questions. There are essay questions, matching test items, multiple-choice items, completion type, and questions which require very short answers. True-false test items are used, but reasons must be given as to why false statements are incorrect. Once in a while students are asked to correct a paragraph in which several incorrect statements have been included.

Essay questions are asked even in these large classes. Experience has shown that the grading of such questions takes many hours, but they do provide a good way to find out how students organize their knowledge of a subject. It is also a means of learning how they can handle practical problems. When occasions come up for which our health teaching should give good background, these students are not going to have sets of cards containing multiple-choice items with them. In answers to essay questions it can be learned how students will explain health subjects to someone else, and how clean-cut their explanations of health terms used commonly in general conversation will be. Thus, in every examination, there are several essay questions and several terms to be defined. Here are two essay questions from a recent midquarter examination.

1. In former years a child who had been actively immunized against diphtheria was thought to have sufficient resistance against the disease to protect him throughout his school life. Today it is recommended that parents of a child entering school have the child given a booster

injection. Why is this thought necessary today? Discuss.

2. You and your husband live on a farm in a midwestern State. Your family uses raw milk from your own herd of cattle. In the summer you have fresh vegetables from your garden. The surplus vegetables are canned at home for later use. The meat your family eats comes from cattle, hogs, sheep, and poultry raised on the farm. Your husband enjoys hunting, and so you have wild rabbits during hunting season. Discuss the measures which should be used to prevent members of your family from contracting each of the following diseases: (a) brucellosis, (b) tularemia, (c) botulism, (d) trichinosis, (e) staphylococcal food poisoning.

Often sentences are excerpted from current articles in newspapers. These deal with some topic which has been discussed in lectures and in the required readings. There is much value in this kind of a question. The students see that the subjects discussed in lectures are not of ancient vintage but are matters of present importance. In fact, generally the quotations are from newspaper articles which appear during examination week, and both the names and dates of the newspapers are given.

Although it takes many hours to read the examinations, it is interesting to find out how students handle a particular subject. After the midquarter examination many interviews are held with members of the class in order to go over the papers with students individually or in groups. Most students appreciate the time given to them and are grateful for assistance. The conferences are of benefit to the instructor as well as the students, for he not only learns their inadequacies in background material but his deficiencies in presentation of the subject. Poor study habits are frequently discovered and remedies suggested. These periods have proved valuable in compensating for the lack of individual instruction in large classes. Attendance is entirely voluntary, but increasingly large numbers avail themselves of the opportunity.

A high academic standard is held in all the health courses. There is no reason why a health course should not demand the same degree of competency as courses in mathematics and physics. There was a day, and let us hope it is gone, when some courses in health were looked upon

as easy ways to gain a few credits and even to pick up some needed honor points. Some institutions of higher learning have never given academic credits for courses in health. Students will never consider the courses important if their college administration doesn't give credits for their successful completion.

Health courses in their organization, teaching, and standards of scholarship must be strong enough to stand alongside other subjects in the curriculum. Why shouldn't a health course require the same standards as other courses? The student in his daily life may never need to balance a chemical equation. But the knowledge which he should gain regarding health practices and attitudes, which this knowledge helps engender, may have an effect on him now and throughout his entire life. It may have an influence on the lives of those in his family and his community (4).

At the end of each quarter a letter is written to every student who has earned an "A" grade in the health courses. The letter is not a form letter with a blank in which the name is written. If such a letter has to be used, it is better not to send one. Customarily, at the end of fall quarter, a Christmas card takes the place of a letter. If a student has made an outstanding record, appropriate emphasis is given to that fact. Not only do the "A" students receive this recognition. A student who has shown unusual improvement in his work during the quarter also receives a letter.

That students appreciate these letters has been shown many times. Last quarter a young man came to inquire as to the reason why he didn't receive one of "the letters sent to the best students." His name had inadvertently been omitted from the list. So a special letter was written to him and, in return, there came a letter of thanks from his father. In large classes it is especially necessary for the instructor to strive constantly to maintain a personal relationship with his students.

Impact of Health Courses

Today there is much discussion about the evaluation of health courses. Many tests have been devised for that purpose. Nevertheless, it is difficult to believe that any test has yet been

made to evaluate adequately and completely the teaching of health to college students. Health knowledge can be tested and a certain standard of performance required for credit in courses. That, however, is not a test of the value of health knowledge as a part of a student's preparation for healthful living. But there are other ways. Very often former students who have become interested in health activities in their home communities will remark that their interest in such work was stimulated while they were in college. Many times students with families will tell that the health problems of their youngsters are much better understood because they had a health course. An engineering student much interested in most of the topics in the health course in which he was enrolled strenuously objected to the use of one class period on the subject of dental health. Nine years later, on meeting him at a football game, he mentioned that he was taking his boys for periodic dental examinations and care. He closed his remarks with the words, "I wish my parents had known about the value of dental care."

Health teaching goes far beyond the classroom. Students discuss health topics at home. Other members of the family even read the textbooks and some of the suggested references. An important value of health courses is the dissemination of health information by students themselves. The realization of this fact should be both challenging and sobering to all who are health teachers in colleges.

There are many indications that students use health knowledge. Teachers never know how frequently this occurs and only hear of such incidents occasionally.

A young war veteran in one of the classes had given his mother a set of aluminum cooking utensils for Christmas a few years ago. Before the next Christmas, she had died of gastric carcinoma. Other members of the family, who had heard the rumor that aluminum cooking utensils are harmful to health and are a cause of cancer, accused him of hastening his mother's death. Their comments worried him. After the lecture on cancer, in which an attempt was made to dispel some of the commonly believed inaccuracies regarding the disease, he arranged for an appointment to discuss the matter. Later

he brought his father and sister to the office for a discussion of the subject in their presence.

A girl brought her father to class after the lecture on "Rumors, Superstitions, and Old-wives' Tales Related to Health." He had felt great remorse because a few years before he had given his wife a set of aluminum cooking utensils. Later she had died of cancer. This man was greatly relieved to learn that his gift had not caused his wife's death.

Any attempt to dispel rumors and superstitions regarding health is one duty of teaching the subject. When this has been accomplished, even in a few instances, a health course has more than justified its existence.

In another incident, a married student, who had taken the health course a few years before, and her husband lived with his mother. When she became pregnant she wanted to see a physician. Her mother-in-law objected strenuously and said that she had nine babies and had never called a doctor until just before the babies came. The couple didn't want to antagonize the mother, and so they did not go to see a physician. Later the young woman noticed that her hands and feet were swollen and that she was becoming very short of breath. She remembered the material she had learned in Public Health 3 regarding signs and symptoms of possible complications of pregnancy. Evidently, from what she said afterwards, there was quite an argument at home, but she went to see a physician who sent her to the hospital. She later gave birth to a healthy, 8-pound boy. One day she came to the office to relate the incident. She had by no means received a high grade in the course, but she had learned some things which proved to be of great value to her. This and similar experiences surely should be considered a better evaluation of health courses than any tests which have yet been devised.

Headaches

That there are some headaches in teaching health courses to large groups cannot be denied. However, they are usually of a transitory nature. Only a few can be described as "migraine" in type. Who and what bring on these headaches? What situations precipitate them? These questions can be answered best by relating some of my own experiences in these classes.

First, there is the student who has always heard that health courses are "snaps" and require little or no effort. Often, so he says, almost everyone received a grade of "A" in his health course in secondary school. He frequently adds that only the poorest students received "B." "Nobody ever worked," he says, "and we spent our time studying courses that were really important." Comments of this sort must be discounted many times but they are heard often.

This student does no work in his college health course until after the first examination. Then, like Dr. Holmes' "one hoss shay," his confidence in his knowledge of health goes all to pieces in one day. He comes to the office to discuss his examination. He searches minutely to discover some fraction of a point with which to bolster his grade. The woman in the Biblical parable who swept her house looking for the lost coin never worked as assiduously as this student. In most instances, after trying every possible explanation for his inadequate performance in the test, he gets down to work. One student who received a low failure in the midquarter quiz achieved the highest grade in a class of more than 600 students in the final examination.

On a few occasions the headaches have been caused by the sons of physicians. These students are confident that their father's Elijahan mantle has fallen on their Elishan shoulders. They feel that a good grade in the health course is their right by inheritance. In their fraternity houses they are often looked upon as veritable fountains of medical wisdom; they can be expected to gush forth with a solution for all medical problems which arise. (I appreciate their attitude and I understand it. For I am also the son of a physician. In my undergraduate college fraternity I was the only physician's son.)

After the first written examination in the health course, the young Hippocrates receives his grade, and when I arrive at my office after class he is already there with fire in his eyes. He informs me that he is of the family of Aesculapius, and he proceeds to prove that I have erred in grading his paper. For proof he quotes his father. I'm sure that his father has never been consulted regarding the correct answers,

and from what the young man tells me the answers are, I sincerely hope he hasn't obtained them from his father.

About this time I reach for the roll book and show the lad his record of nonattendance in class. In most instances, his next examination shows a tremendous improvement and he begins to stop at the desk when class is over to discuss some point in the day's lecture. He comes to my office to obtain references for further reading. If he becomes a medical student, I meet him again in class. He will laughingly recall his experience in the introductory health course.

A few students feel that since this is a health course they don't need to attend. "Everybody knows health stuff," is such a lad's remark. So he stays away and has an hour of leisure. Or, as has happened occasionally, he decides to attend some other class at the same hour, and he only comes to health class on the day when there is an announced written examination. He has a change of heart after the first examination, but it's often too late for him to make up for his lost time. He may withdraw from the course. I find him in class in a subsequent quarter.

Another source of headaches gets rarer every year. I refer to some fraternity brother who serves as a counselor to new students (or sometimes, but seldom now, a faculty adviser) who says to the student, "You have to take the health course, so let's add it to the courses you've selected. It's only a health course and it won't be any extra work." At least, that's what some students tell me they have been told. Most often such students cancel out of the course.

Every quarter a few students speak up in class and inform me that something I have said isn't what their family physician told them recently. In discussing food poisoning, I mentioned that the term "ptomaine poisoning" is really a misnomer. The words had scarcely passed my lips before a boy in the rear of the auditorium raised his hand and said, "I had 'ptomaine poisoning' last summer after a picnic, and my doctor said it was the worst case he had taken care of for many years. And he sees lots of patients. You should see how crowded his office is." Maybe his physician did make that diagnosis; perhaps, in discussing his illness with my student, he did use that term because he

knew it was one with which many persons are familiar. Such situations, when they arise in class, need their own particular management; some of them have to be handled with gloves.

There is also the student who has had, in some elementary course, a small exposure to anatomy and physiology. He delights in airing his small fund of knowledge before a large audience. I never disparage his attempts to add to the discussion, but I insist that his contribution be scientifically correct.

One day I was telling of a fracture of the lower end of the femur in commenting on a playground accident which had happened that week. I was explaining what had occurred and was asked a question about the position of the distal fragment. In my discussion, which I illustrated with a diagram, I mentioned the gastrocnemius muscle. A student immediately spoke up and said that I was entirely wrong, for that muscle was found only in the foot far away from the femur. He held tenaciously to his point and, in no uncertain terms, informed the class and me that he had studied anatomy.

I told the class that the student and I would go to the anatomy laboratory and give them a report the following day. One of my friends of the anatomy staff kindly provided us with a demonstration specimen which showed the muscles of the lower extremity. My student and I spent an interesting hour. The next day he reported to the class, and I drew diagrams on the board to illustrate his remarks.

When similar situations arise in class, I am convinced that the misinformation of the student should be corrected by having him search for the correct facts and report to the group. This may be done by referring him to standard references in the library or having him seek information in the laboratory.

Pope's words that "a little learning is a dangerous thing" is demonstrated time and again in health classes. It is always more difficult to correct an error than to teach a new fact, but in some way the student must learn when information is fallacious.

The last of the headaches is the group of students who have received the impression that a health course should give them knowledge of how to treat themselves when they are ill. The most derogatory criticism of the Public Health

3 course which I have ever been sent turned out to be the finest comment on it. A young woman who received the lowest grade that quarter wrote me a long letter and closed with these words: "This course has been a waste of time. I signed up for it so that I could learn how to treat myself and wouldn't have to pay a doctor. You have never once given us any prescriptions. Everything was about preventing disease and seeking medical care early. So I stopped coming to class the second week. My adviser told me to take the final examination anyway, but I couldn't answer the questions. He says I'll have to enroll in it again; I'll be seeing you in class next week." There aren't many of this variety.

Rewards

The teaching of large classes over a period of years brings a special recompense. Students scatter widely throughout this country, and some go to foreign lands after graduation. On a transcontinental plane the stewardess calls you by name and recalls that she had the health course in 1951; in the doorway of a Los Angeles hotel a former student introduces you to her husband; on the street in a southern city someone calls you by name and stops to reminisce about the health course "way back in 1948"; in Trafalgar Square a student who now lives in London surprises you while you're reading your Baedeker, and he invites you home to see his wife and daughter and have a cup of tea with them; on football Saturdays you are greeted by many you have had in your classes. Such experiences far transcend in value the hours you have spent, and even the headaches you've had, in the teaching of large classes.

Summary

It can be said that fundamentally there is little difference between teaching small and large health classes. The objectives and content are the same; methods are necessarily different. I imagine there are some headaches even in small classes. In the final analysis, it seems to me that especially we who teach large classes must strive in every possible way to maintain the personal relationship between teacher and student, even at the expense of giving up some academic duties which really are of lesser sig-

nificance compared with the responsibilities and opportunities we have as teachers of health courses.

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Develop Vaccine for Respiratory Ills

Contracts for development of prototype "common cold" vaccines and for clinical evaluation of these vaccines have been awarded by the Public Health Service in an endeavor to make full use of existing information about respiratory tract viruses even as laboratory research continues to uncover new information.

In the new program, small pilot lots of vaccine will first be evaluated for potency and tested for purity and safety. If preliminary trials are successful, controlled evaluation will continue in field trials. Next, larger lots of vaccine will be tested on young adult volunteers from selected military or prison populations and, finally, on civilian populations.

Dr. Justin M. Andrews, director of the National Institute of Allergy and Infectious Diseases, and other scientists cautioned that effective vaccines may take many years to develop, since at least 20 viruses have been identified as important agents of respiratory illness. Known viruses are implicated in about 60 percent of the serious respiratory illnesses of hospitalized children. These viruses—the parainfluenza viruses, respiratory syncytial viruses, adenoviruses, and PPLO-Eaton agent—will receive immediate attention in the vaccine program.

In the United States, respiratory illness causes more time lost from work than any other disease. It is estimated there are 1 billion episodes annually and an economic loss of about \$5 billion. Preschool children have more than 20 million episodes with fever each year, and pneumonia as a complication is a leading cause of death in young children.